Site Assessment Report

South County Bike Facilities
The Narrow River Bike Path

Narragansett,
Rhode Island

Prepared for **State of Rhode Island Department of Transportation**
Providence, Rhode Island

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Providence, Rhode Island

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Project Description

Background

The State of Rhode Island Department of Transportation (RIDOT) commissioned, at the request of the Town of Narragansett and the Town of North Kingstown, a study to evaluate the feasibility of developing bicycle facilities within these communities. The results of this Feasibility Study, titled West Bay Bikeway and completed in January 1999, recommended several Short-Range and Long-Range projects be implemented. The Short-Range projects concentrated on providing signing and striping improvements along with minor roadway improvements to a 21.4-mile north-south bike route along Ocean Road, Beach Street and Boston Neck Road, providing a connection between the Port of Galilee and Wickford Village. The improvements for this 21.4-mile bike route have been implemented.

A vision for this 21.4-mile bike route was to provide a 'spine' for connecting future bikeway and multi-use path developments throughout the region. Opportunities for the development of such paths were identified west of the Boston Neck Road between Bridgepoint Drive and Mettatuxet Road in Narragansett. Both the former Seaview Trolley Line corridor, which is currently utilized as the Narragansett Electric Easement for power distribution, as well as, an existing sewer easement both offer an opportunity to develop a multi-use path as a separated facility from the bike route along Boston Neck Road.

The Town of Narragansett submitted a project application as part of the 2001-2002 Transportation Improvement Program (TIP) for the study and development phase of a separated facility from the Boston Neck Road on road bike route, utilizing portions of the former Seaview Trolley Line Corridor and/or the sewer easement between Boston Neck Road and Mettatuxet Road. The project application was approved by the Transportation Advisory Committee (TAC) and included in the TIP.

Project Purpose

A 2003 Urban Mobility Study developed by Tim Lomax and David Schrank of the Texas Transportation Institute details the increasing costs of traffic congestion across the United States, totaling 3.5 billon hours of lost productivity at a cost of $69.5 billon in 2001. This represents a $4.5 billon increase from the previous year. The study discusses the need to implement a variety of solutions to ease the impacts of increasing traffic.

As conventional transportation solutions to increase capacity become more costly and restrictive, alternative approaches to improve efficiency and decrease demand on the roadway system are being implemented. Implementing a combination of solutions, including various operational treatments and public transit improvements, as well as, facilitating bicycle and other non-vehicular modes of traffic can alleviate congestion on the roadways, decrease the amount of fuel wasted and improve the reliability of the areas transportation network.

The University of Rhode Island Transportation Center in conjunction with the Rhode Island Department of Transportation has completed a research project titled 'Bicycle Transportation User Survey Developing Intermodal Connections for the 21st Century'. To view the results of this survey, visit URITC's web site at www.uritc.uri.edu. The purpose of this research project was to develop, analyze and disseminate a comprehensive bicycle user survey that provides key insights into the factors that encourage and/or discourage bicycle use as an alternative travel mode in the State of Rhode Island. The recommendations of this study, should be incorporated into the final design of any proposed multi-use path to ensure specific user preferences are considered in the projects approach.

The Town of Narragansett's Comprehensive Plan, dated 1994 and updated in 1998 and 2001, identifies the town as a 'residential community with a unique seaside identity which provides a satisfying, healthy and supportive environment for residents of all ages and backgrounds'. In support of this identity, the Comprehensive Plan details a variety of goals for the town to pursue. Some of these goals are:

- To match the growth of the town with recreational facilities
- Promote land use patterns reflecting and respecting the town's natural resources
- Provide generous amounts of open space and recreation facilities between built-up areas
- Encourage the development of linear transportation facilities which provide an alternative to automobile travel

To achieve these goals of the Comprehensive Plan, the Town of Narragansett has specified the need to 'promote and develop a linked recreational open space network with trails, beaches, public access ways and parks in Narragansett and surrounding towns'.

The development of the Boston Neck Road on-road bike route provided an important transportation corridor through the Towns of North Kingstown and Narragansett for bicyclists. Additional bike routes and paths are necessary to provide residents an alternative to automobile travel between their homes, the natural attractions and open space areas, and the various bicycle routes available within the Town of Narragansett. Promoting these transportation alternatives is an essential step in achieving the stated goals of the town's Comprehensive Plan.

Both the existing electric easement along the former Seaview Trolley Corridor and the sewer easement corridor provide a clear route through one of the town's scenic resource areas and promote access to the town owned parcel called Bridgepoint Commons. A multi-use path along these corridors would accomplish many of the towns objectives discussed throughout the Comprehensive Plan, including developing passive and active recreational facilities, providing transportation alternative links between various land uses, promoting access to the natural resources throughout the town, and utilizing the Bridgepoint Commons acquisition for passive recreation by providing area residents and visitors improved access to these resources.

Realizing the importance the paths have as recreational and transportation alternatives to the Town of Narragansett, RIDOT has hired Vanasse Hangen Brustlin, Inc. (VHB) to study the feasibility of developing a multi-use path, as a separated facility from the Boston Neck Road bike route, along the former Seaview Trolley Corridor or the sewer easement corridor between Boston Neck Road and Mettatuxet Road.

Existing Conditions

The Town of Narragansett is located, along the Narragansett Bay at the southern end of Rhode Island and borders the towns of North Kingstown and South Kingstown. The population for The Town of Narragansett as of April 1, 2000, was 16,361. This represented a 9.18% increase 1,376 persons) from the 1990 population of 14,985.

The project study area is depicted in the 'Project Location Map' Figure 1 with the surrounding roadway network. The project study area generally follows the former Seaview Trolley Line corridor, which runs generally north-south along lands west of Boston Neck Road and east of the Pettaquamscutt River from the Narrow River to Mettatuxet Road. Alternate alignment studies included portions of the existing sewer easement generally located west of the former Seaview Trolley Line corridor. The surrounding land is mostly single resident houses, some multi-residential developments and large areas of undeveloped open spaces and wetlands.

Existing Roadways

The study area is bordered and intersected by a number of roadways. Boston Neck Road (Scenic Route 1A) provides the only connection over the Narrows River (Sprague Bridge) east of the Pettaquamscutt River. The roadway is a two-lane principal urban arterial roadway with shoulder widths approximately eight feet in width, intermittent curbing and a posted speed limit of 40 mph. The bridge section maintains the roadway dimensions and also provides 6-foot sidewalks on both sides of the deck. A signed on-road bike route is designated along Boston Neck Road.

Bridgepoint Drive is a paved cul-de-sac roadway that has been blocked off to prevent vehicular traffic from entering. This roadway is the remnant of a planned development for which the town later obtained the property, now known as Bridgepoint Commons. The paved section is generally 20 feet in width with some drainage improvements incorporated.

West Bay Drive and Secluded Drive are local/collector two lane roadways generally 24 feet in width with bituminous curbs. These roadways serve the local area residential properties and generally have speed limits of 25 mph.

Source: Kingston, RI (1975) U.S.G.S. Quadrangle

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Project Location Map — Figure 1
Narrow River Bikepath
South County Bicycle Facility Site Assessment Project
Narragansett, Rhode Island

Middle Bridge Road is an east-west two-lane major collector roadway with a posted speed limit of 25 mph. The roadway consists of two 11-foot lanes with one-foot shoulders and no curbing. Middle Bridge Road provides access across the Pettaquamscutt River (bridge under reconstruction May 2003). The next available river crossing is along Bridgetown Road (Route 138) approximately 2 miles to the north.

Mettatuxet Road is a two-lane major collector roadway with two 10.5-foot lanes, 2-foot shoulders, curbs and a 5-foot sidewalk along the north side. The posted speed limit on Mettatuxet Road is 25 mph.

The Average Annual Daily Traffic (AADT) volumes for the various roadways within the study limits are presented in Table 1 with additional traffic volumes for area roadways presented on the RIDOT Traffic Flow Map provided in the Appendix.

Table 1 -
Existing Traffic Volumes (AADT)

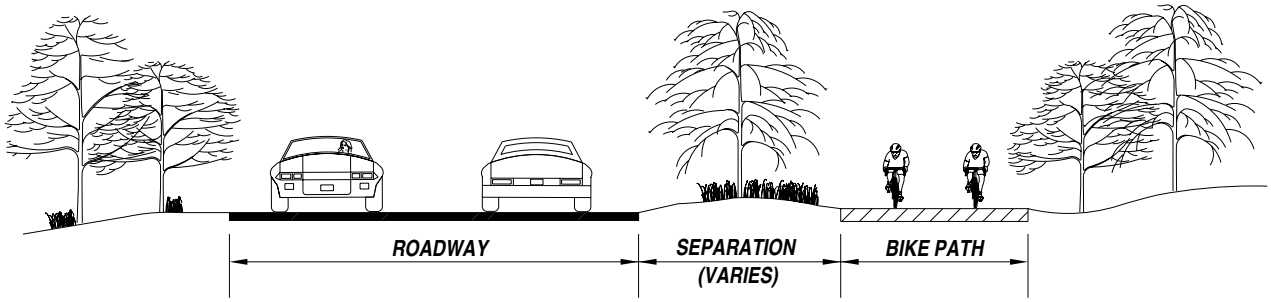
Roadway Segment	AADT (Year)
Boston Neck Road at Sprague Bridge over the Narrows River	8,800 (2000)*
Boston Neck Road at Mettatuxet Road	11,000 (2000)*
West Bay Drive	1,400 (2003)**

Sources: * Rhode Island Department of Transportation – Traffic Section
** Automatic Traffic Recorder (ATR) counts conducted 7-27-03

Accident Analysis

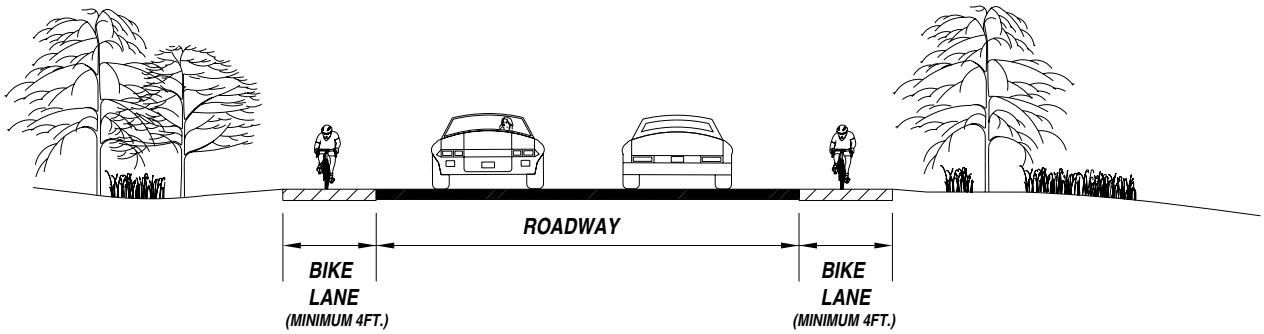
The past traffic accidents along several of the roadways within the study area were reviewed. Accident reports were obtained from the Narragansett Police Department for the most recent three-year period from September 2000 to August 2003. A summary of the accident reports along Boston Neck Road and Middle Bridge Road is presented in the Appendix.

The Narragansett Police Department records indicated no recorded accidents along Mettatuxet Road from Boston Neck Road to Juniper Trail within the three-year period from September 2000 to August 2003. Two accidents were reported along West Bay Drive during the three-year period from September 2000 to August 2003, however specific information regarding the conditions of these accidents was not available.



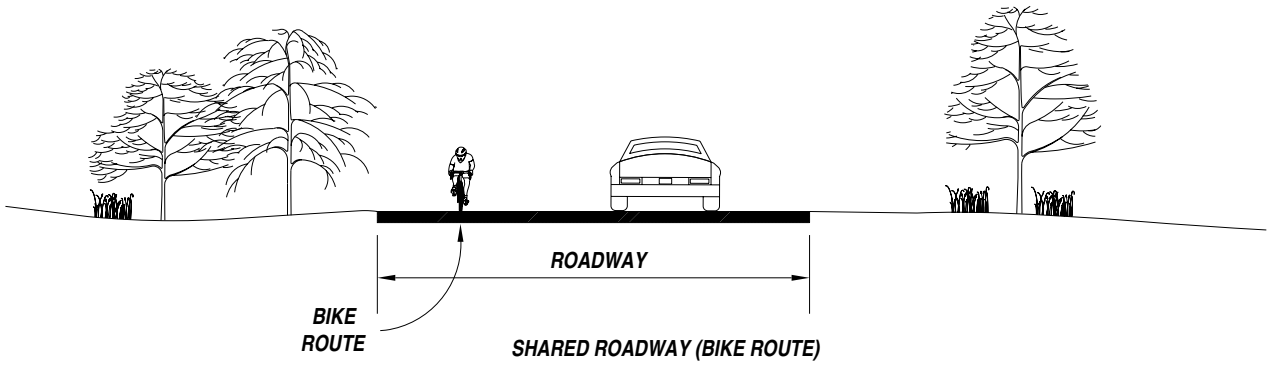
MULTI-USE PATH / BIKE PATH
(SEPARATED FACILITY)

A PATH FOR THE EXCLUSIVE USE OF BICYCLISTS, PEDESTRIANS, ROLLER BLADES, ETC. PHYSICALLY SEPARATED FROM MOTORIZED VEHICULAR TRAFFIC EITHER WITHIN AN EXISTING RIGHT-OF-WAY OR ON A COMPLETELY NEW LOCATION



BIKE LANE

A PORTION OF A ROADWAY WHICH HAS BEEN DESIGNATED BY STRIPING, SIGNING, AND PAVEMENT MARKINGS FOR THE PREFERENTIAL OR EXCLUSIVE USE OF BICYCLISTS.



SHARED ROADWAY (BIKE ROUTE)

A SHARED RIGHT-OF-WAY WITH (BIKE ROUTE) OR WITHOUT SIGNING.

Figure 2
Bicycle Facilities
South County Bike Path Assessment

Existing Bikeway Facilities

Existing bikeways in and around the Town of Narragansett provide transportation alternatives for the residents and visitors of the community. Bike paths and trails offer access to open spaces and recreational facilities, commercial areas, schools, and other neighborhoods and serves as a recreational facility for the area residents.

There are generally three different types of bicycle facilities: Bike Route, Bike Lane and Multi-Use Path / Bike Path (Separated Facility). Figure 2 illustrates the differences between these facilities.

Existing and planned bicycle facilities in various stages of development in and around the Town of Narragansett are illustrated in Figure 3, as well as, the 'South County Bike Path' map and the 'Guide to Cycling in the Ocean State' map both provided in the Appendix.

The Department of Transportation has made improvements to Boston Neck Road (Route 1A) from the Town of North Kingstown Town Hall, located near the Reynolds Street intersection, south through the Town of Narragansett and continuing on Ocean Road and Beach Street to the Port of Galilee. These improvements included the erection of signing along the roadway to indicate the roadway is a 'Bike Route' and spot improvements to facilitate and encourage the roadways use as a shared roadway. The bike route has intermittent curbing and wide shoulders delineated by pavement striping and provides a travel route for bicyclists of average to above average skill, due to vehicle travel speeds experienced along sections of Boston Neck Road. Additional on-road bike routes are located between the Galilee and Point Judith areas of Narragansett.

No other roadways within the study corridor area are marked as bike routes or are listed on the 'Guide to Cycling in the Ocean State' map as suitable for cycling.

The South County Bike Path is a dedicated multi-use path currently running from Amtrak's Kingston Station to Peace Dale in South Kingstown. An extension of the path is currently under construction from Rodman Street to Route 108 and is substantially complete. An extension of the path, known as Phase 3, to continue the path to Mumford Road is at the 90% design level. A conceptual design, known as Phase 4, to extend the path to the South County Museum is being considered.

Area Attractions

The project study area runs through a variety of land uses (see Appendix for current land use details) but generally low/medium density residential neighborhoods with large surrounding areas of open space, forested lands and scenic vistas. The northern limits enter into a medium density residential region and some commercial

developments nearby along Boston Neck Road. The southern limits of the path abut the open space of Bridgepoint Commons, the large town-owned parcel of land north and west of Bridgepoint Drive. Access to the Pettaquamscutt River is also available in this area.

Area attractions currently served by the on-road bike route along Boston Neck Road include the South County Museum, Sprague Park, Narragansett Pier, private and town beaches, access to ferries to the south and various natural attractions and open spaces. See Figure 3 for locations of various area attractions. The locations of current and potential historic areas are also presented in the Appendix. The development of a separated facility west of Boston Neck Road would offer users of the on-road bike route, as well as, less skilled riders, joggers, a skaters and pedestrians a multi-use path to access various open space areas and other residential areas.

Vanasse Hangen Brustlin, Inc.

Figure 3

Project Study Area
The Narrow River Bike Path
Narragansett, Rhode Island

Evaluation of Alternates

The focus of this report is to assess the impacts and to evaluate alternate routes for developing a dedicated multi-use path as a separated facility from the on-road bike route along Boston Neck Road. The two primary routes identified as potential corridors for such a multi-use path are the former Seaview Trolley Corridor, now utilized as an electric easement, and a combination of portions of the former Seaview Trolley Corridor with portions of the existing sewer easement.

Route Alternative Matrix

The Town of Narragansett stated that the use of the sewer easement for the path alignment complemented their needs for vehicle access to maintain the existing sewer interceptor running along the easement. Currently the sewer easement traverses mostly unimproved lands between Boston Neck Road and South Bay Drive, which makes vehicular access problematic.

A Route Alternative Matrix, Table 2, was developed to compare utilizing portions of the sewer easement corridor as the multi-use path route with utilizing the electrical easement corridor in order to establish a preferred route for a multi-use path. The influencing factors were divided into five categories: Environmental Impacts, Right-of-Way Acquisition, Safety Issues, Intrinsic Route Value and Costs. The Route Alternative Matrix summarizes the various benefits and impacts of the two identified routes to determine the best route that would serve bicyclists of all abilities, as well as, joggers, skaters and pedestrians.

A listing of the current property owners of the corridor planned for both route alternatives is provided in the Appendix with the abutting property owners also identified. The Tax Assessor Maps detailing the location of the corresponding lot numbers is provided in the Appendix.

The electric easement route was evaluated along the following alignment and generally following the abandoned trolley line track bed: beginning at the southern limits of the abandoned roadway, Bridgepoint Drive; thence north along the paved surface to the cul-de-sac end; thence northerly following the western edge of parcel N-O Lot 8 to parcel N-L Lot 41 and then to the beginning of the Narragansett Electric Easement on parcel N-L Lot 41-4; continue northerly along the Narragansett Electric Easement to Mettatuxet Road, crossing Morgan Drive cul-de-sac, Middle Bridge Road, Secluded Drive, and West Bay Drive.

The sewer easement route was evaluated along the following alignment: following the same route described above for the electric easement route from the southern limits of the Bridgepoint Drive up to the crossing at Middle Bridge Drive; thence continue north along the sewer easement to the southern limits of parcel N-Q 50-86; here the route is directed easterly along a lateral sewer easement towards South Bay Drive; the lateral sewer easement section terminates at South Bay Drive, the evaluated route continues easterly, south of the condominiums along South Bay Drive, until intersecting with the electrical easement; the route continues northerly along the electrical easement, crossing West Bay Drive and continuing to Mettatuxet Road.

The sewer easement routing was selected to incorporate portions of the sewer easement while providing a connection to the local roadway system and minimizing the impacts of property acquisition to private properties. Utilizing Bridgepoint Drive and the electrical easement to Middle Bridge Road saves costs for construction, provides a direct connection from Boston Neck Road, minimizes impacts to wetlands and floodplains, and eliminates the need for two ninety degree turns. At parcel N-Q 50-86, a privately owned residence, the sewer easement crosses a private driveway, continues along Denison Drive and through several private residences before ending south of Woodbridge Road. Continuing the path along this portion of the sewer easement would negatively impact several residences and not provide connectivity to Mettatuxet Road, thus the route selected was deviated back to the electrical easement.

It is additionally noted that the Town of Narragansett requires access along the length of the sewer easement to perform maintenance operations. The development of a separated path facility along the sewer easement would offer added value to the Town by providing a paved surface for their truck access. Currently the sewer easement traverses mostly unimproved lands, which makes vehicular access problematic.

Route Alternative Conclusion

The electrical easement route alternative is selected as the best route for consideration as a multi-use path due to the limiting impacts to the environment, construction costs, as well as, right-of-way acquisition and general safety concerns.

Table 2
ROUTE ALTERNATIVE MATRIX

	Electrical Easement Route Alternate	Sewer Easement Route Alternate	
Issues \ Route	**Bridgepoint Drive to Electrical Easement; to Mettatuxet Road**	**Bridgepoint Dr. to Electrical Easement; to Middle Bridge Rd; follow Sewer Easement to Parcel N-Q 50-86; to South Bay Drive; to Parcel N-Q 52; to Electric Easement; to Mettatuxet Road**	**BEST ROUTE**
Environmental Impacts	- Wetland impacts limited to localized areas and at structure crossings - Path has little to no encroachment into the floodplain - Existing berm & ditches provides general foundation for path construction	- Majority of route is located within wetlands - Potential encroachments into the floodplain - Lack of existing berm for construction requires significant impacts to develop base and drainage facilities	Electrical Easement Route
Right-of-Way Acquisition	- 17 private property owners in addition to the US Fish and Wildlife - Majority of route is along 50 foot electric easement	- 5 private property owners; US Fish and Wildlife owns majority of the route - Majority of the route is along 20 foot sewer easement - Additional Right-of-Ways/easements required due to the limited 20 foot wide easement width - US Fish and Wildlife concern that bike path will result in bicycle use in forest areas other than paved bikeway	Electrical Easement Route
Safety Issues	- Route requires 3 roadway crossings plus dual utilization of a cul-de-sac bulb - Direct line of path provides better sight lines for users	- Route requires 3 roadway crossings plus dual utilization of a cul-de-sac bulb - Sanitary manhole covers located along the path are undesirable - Use of path by maintenance vehicles for the sewer main access creates conflict with bike path users	Electrical Easement Route
Intrinsic Route Value	- Provides potential for direct access from multiple residential properties through individual backyards - Street crossings and proximity of cul-de-sacs may allow additional access opportunities to residents	- Potential dual use of path by Town of Narragansett to access and maintain their sewer main - The paths bordering mostly USFW property minimizes disturbances to residents - Path provides scenic views through open space areas - Provides direct access from multi-residential condominiums - A paved path for maintenance vehicles would limit impacts to environment as compared to trucks driving on ground - Sanitary manhole covers along the route would degrade the routes aesthetic value and possible decrease ridership	Sewer Easement Route
Costs	- Several utility poles will need to be relocated - General embankment and drainage needs for path construction are in place from former trolley line construction - Direct acquisition costs could be higher due to multiple owners to acquire from, value of the land and width of easement	- Sewer easement boundary has been surveyed and monumented - Restrictive width of existing easement may compound costs to construct path - Mitigation costs of impacts to wetlands and floodplain - Expanding rights of sewer easement to include bicycle path use	Electrical Easement Route

Evaluation of Multi-Use Path Route

The development of a multi-use path west of Boston Neck Road from the Narrow River to Mettatuxet Road will provide a transportation alternative to the Boston Neck Road on-road route for less skilled bicyclists, as well as a recreational and educational asset to the local community and the Town of Narragansett. A dedicated path along this 2-mile corridor adjacent to the Pettaquamscutt River can offer residents and area visitors the opportunity to enjoy the scenic environment while minimizing impacts to the fragile ecosystem.

The following discussion outlines the specific conditions, obstacles and opportunities involved with the creation of a dedicated multi-use path through the corridor of the former Seaview Trolley line currently utilized as the Narragansett Electric Easement.

In accordance with the AASHTO Guide for the Development of Bicycle Facilities (1999) the preferred proposed path typical section is a paved 12-foot path with 2-foot shoulders at 6:1 grades. Horizontal clearances from the edge of the paved path to the top of slope for fill slopes 3:1 or steeper should be 5 feet minimum.

Figures 4 thru 7 detail the multi-use path corridor evaluated with the approximate adjacent parcel limits indicated on top of an aerial print. Additional features impacting the route are described below and indicated on these aerial figures.

Existing Corridor Conditions

The Narragansett Electric Easement runs along the former Seaview Trolley line corridor extending from north of Bridgepoint Drive to Mettatuxet Road and continues north. The entire limits of the electric easement maintain wooden utility poles and electrical transmission lines operated by Narragansett Electric. The surrounding lands are roughly graded to flow from east to west towards the Pettaquamscutt River. A raised berm remaining from the track bed of the former trolley line runs down the approximate center of the easement for the majority of the length with variable ditches draining water on either side. The easement is approximately 50 feet in width and is routinely cleared of vegetation under the power lines.

At the southern end of the route, being the intersection of Bridgepoint Drive with Boston Neck Road, a pump station exists to the south and a 38.3 acre field, called Bridgepoint Commons, covers the north and east sides of Bridgepoint Drive. Bridgepoint Commons is a town owned parcel managed as the Bridgepoint Commons Conservation Area. Bridgepoint Drive is a bituminous paved roadway

blocked by a number of large boulders to prevent vehicular traffic access, however a portion of the existing roadway is utilized as parking for walkers and joggers visiting the area. Bridgepoint Drive shows evidence of some abandoned drainage system in place. West of the roadway is generally wooded with dense vegetative growth. The east side of the roadway is open to a large field. The roadway terminates approximately 1,350 feet from the intersection with Boston Neck Road in a cul-de-sac.

Proceeding northerly from the cul-de-sac, through a wooded area and following the westerly line of parcel N-O Lot 8, the route joins the electric line corridor. A cleared berm exists approximately 15 feet in width, with a 2 foot deep ditch and utility poles along the east side of the berm. A 24" culvert located 600' north of the Bridgepoint Drive cul-de-sac drains the ditch to the west. Approximately 800 feet north of the Bridgepoint Drive cul-de-sac, the electrical easement corridor crosses the end portion of the Morgan Drive cul-de-sac, being a sidestreet servicing 10 private residences and town houses. The cleared berm continues on the north side of the cul-de-sac to the crossing of Middle Bridge Road.

Middle Bridge Road is a two-lane roadway providing access across the Pettaquamscutt River to the west. The road consists of 11-foot lanes, one-foot shoulders and no curbing. A number of houses line the roadway with yards that abut the electric easement.

Continuing north along the electric easement route, a ditch exists along the west side of the cleared path and crosses the path as an open ditch 300 feet north of Middle Bridge Road. The utility poles run along the east side of the path. The berm becomes less defined as the route continues north to a depressed area adjacent to the Ridge Drive cul-de-sac. North of Ridge Drive a 20-foot wide cleared berm forms again with ditches along both sides. The berm curves to the east and back to the west between utility poles #537 and #536, located approximately 400 feet north of Ridge Drive. A large low-lying area with standing water, fed by an 18" culvert at the northern end, exists along the east side of this jog.

The electric easement traverses an area with a number of residential homes to either side. Proceeding towards Secluded Drive, the utility poles and an 8-foot deep ditch run along the east side of the raised berm with a smaller drainage swale on the west side. A number of private residences border the electric easement though this area with a line of vegetation separating the yards from the easement.

Secluded Drive is a two-lane roadway, 24-foot wide pavement with bituminous berms and no pavement markings. A 24" culvert drains south from a catch basin in the roadway into the ditch along east side of the berm. North of the roadway a front lawn and a landscaped area maintained by the contingent property owners encumbers the electric easement for a length of approximately 60 feet.

Proceeding north from Secluded Drive, past the front lawns and landscaped areas, a 20-foot wide cleared path along the berm re-emerges with the utility poles running along the east side and bordered by low ditches. Wooded lands generally surround the electrical easement. A collapsed stone culvert of undetermined size drains the eastern ditch to the west approximately 800 feet north of Secluded Drive. The ditch along the west edge of the berm gradually becomes more pronounced and deeper, becoming 10 feet deep and generally draining north to a low lying wetland area. A single 12-foot span wood timber bridge with stone abutments located approximately 950 feet south of West Bay Drive traverses a drainage ditch crossing from the east side of the berm to the west. This ditch drains to the low-lying wetland area identified to the south.

From the north side of the bridge structure to West Bay Drive, a rock lined ditch, 4 feet wide with 1:1 side slopes parallels the cleared raised berm on the east. Approximately 100 feet north of the bridge a trail leads to the east into a wooded region with a 48" culvert maintaining the ditch flow. A 'Keep Out' sign is posted at the edge of the trail. The utility poles run along the center of the 20-foot wide berm north of the bridge for approximately 500 feet. The west side of the berm generally grades to the west where a number of residences with limited vegetation separating the yards from the easement exist.

The electric easement route crosses West Bay Drive, a two-lane roadway 24 feet wide with bituminous berm curbs and no shoulders. Short segments of wooden guardrail along the north and south sides of the roadway shield a 36" culvert that connects the ditch running along the east side of the berm. Private residences exist in all four quadrants of the West Bay Drive / electric easement intersection.

Continuing north from West Bay Drive along the electric easement, the berm is generally 15-20 feet in width with utility poles continuing on the east side of the berm and 4-foot deep ditches along both sides. This section is maintained until meeting Mettatuxet Road, except for a single utility pole located on the west side of the berm at a curve in the easement. Several locations within this area indicate the probable presence of a culvert, however during field investigations, none were located. East of the electric easement a number of new residences are being constructed.

The electrical easement meets Mettatuxet Road, a two-lane roadway with 10.5-foot lanes and 2-foot shoulders and curbs.

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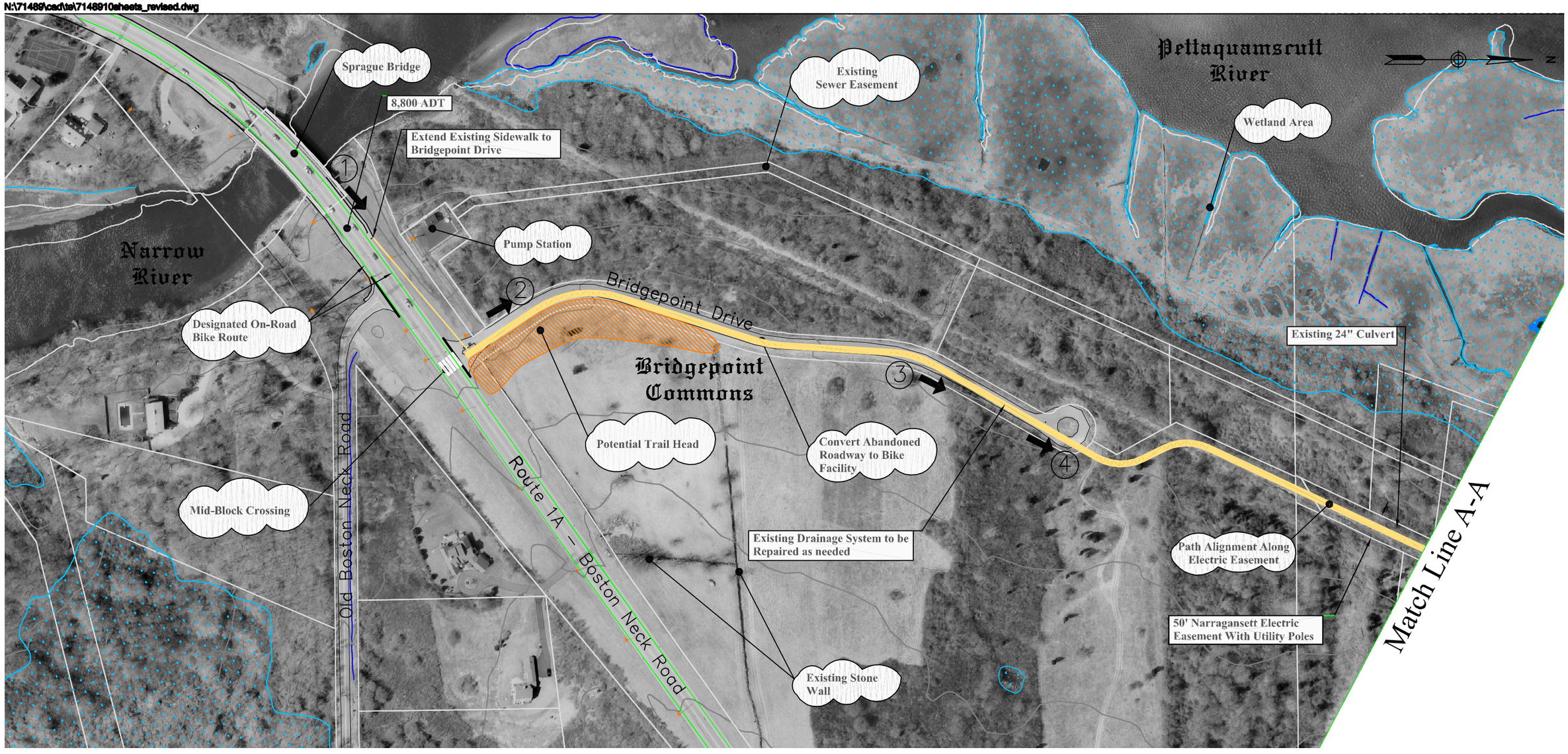
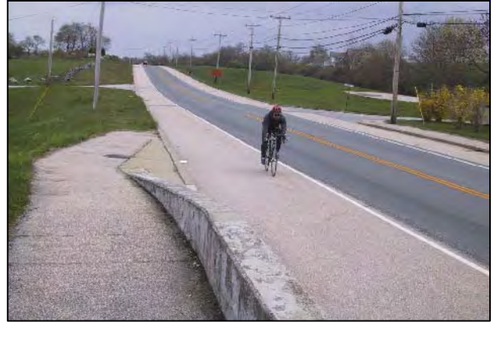


Picture 1 - Looking NB Along Boston Neck Road



Picture 2 - Looking SE along Bridgepoint Drive

Picture 3 - Bridgepoint Drive - Note Drainage Deficiencies

Picture 4 - Bridgepoint Drive Cul-De-Sac

0 100 200 FEET

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Figure 4

Multi-Use Path Layout Plan
The Narrow River Bike Path
Narragansett, Rhode Island

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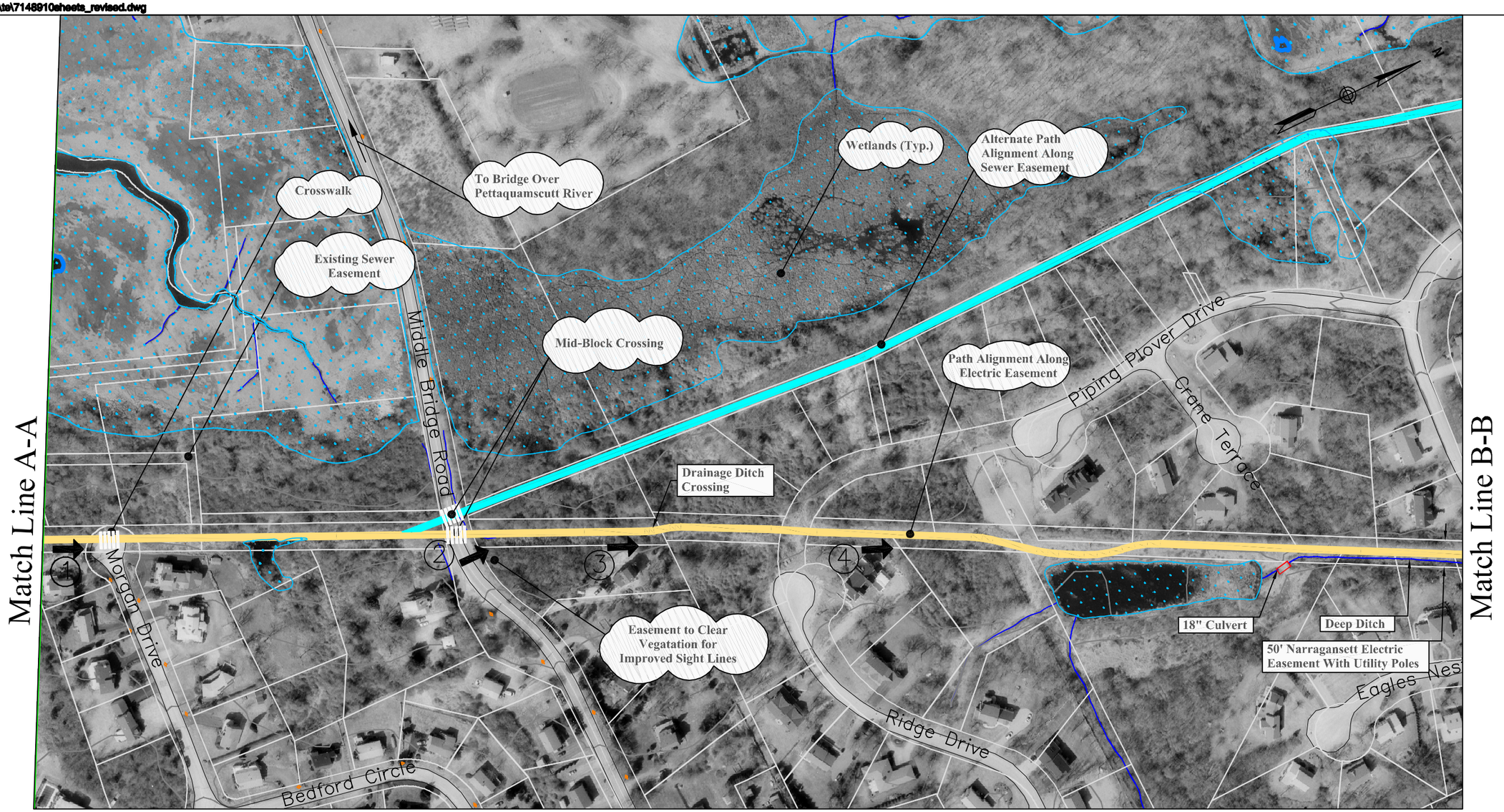

Picture 1 - Loooking North at Morgan Drive Cul-De-Sac

Picture 2 - Looking North Along Electrical Easement

Picture 3 - Open Ditch Crossing of Berm

Picture 4 - Looking North along Electrical Easement

0 100 200 FEET

Vanasse Hangen Brustlin, Inc.

Figure 5

Multi-Use Path Layout Plan
The Narrow River Bike Path
Narragansett, Rhode Island

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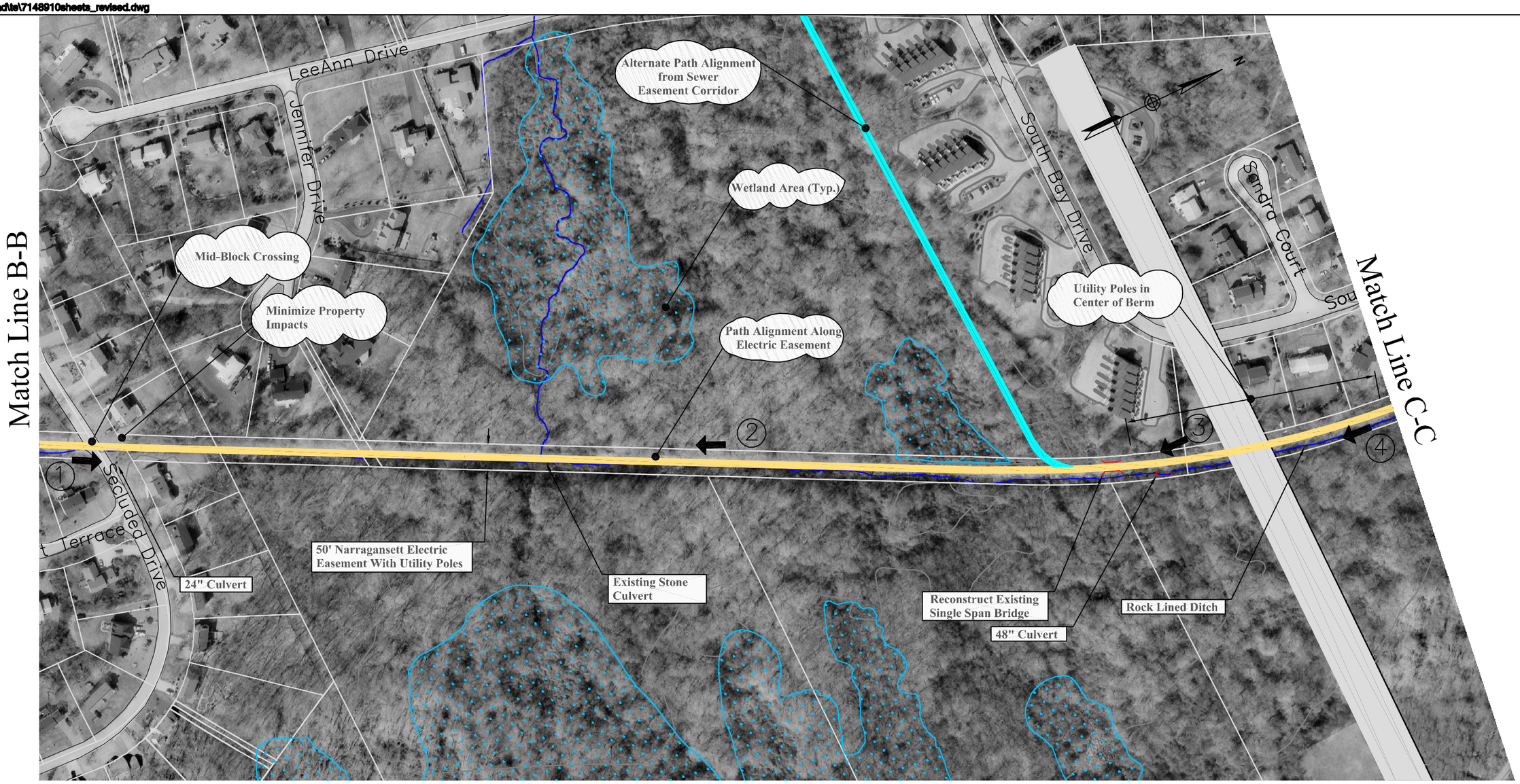

Picture 1 - Looking North Along Electrical Easement

Picture 2 - Looking South Along Electrical Easement

Picture 3 - Single Span Timber Decked Bridge

Picture 4 - Looking South at Rock Lined Ditch

0 50 100 FEET

Vanasse Hangen Brustlin, Inc.

Figure 6

Multi-Use Path Layout Plan
The Narrow River Bike Path
Narragansett, Rhode Island

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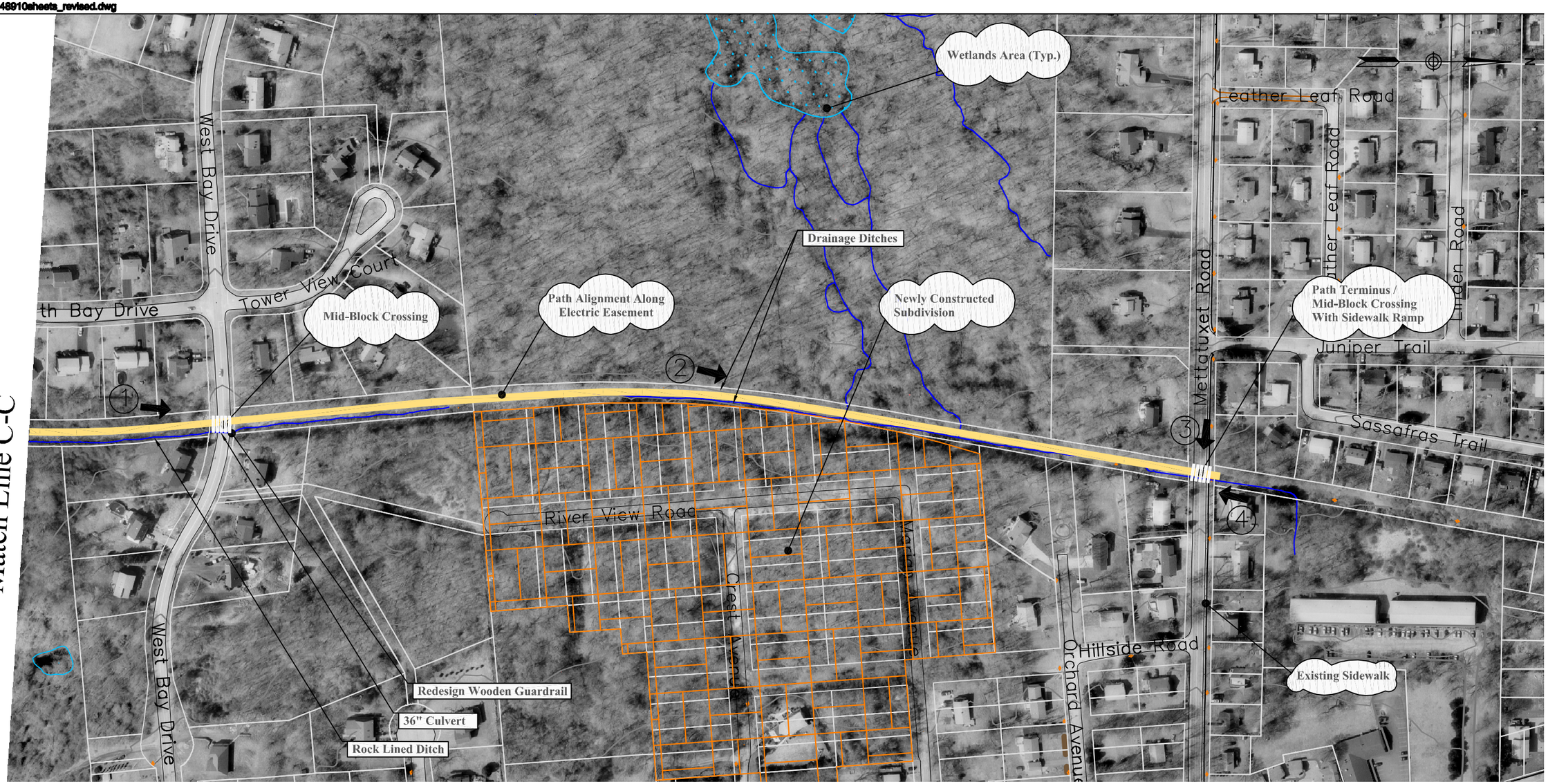

Picture 1 - Looking North Across West Bay Drive

Picture 2 - Looking North Along Electrical Easement

Picture 3 - Looking North Along Mettatuxet Road

Picture 4 - Looking South Along Electrical Easement

0 50 100 FEET

Vanasse Hangen Brustlin, Inc.

Figure 7

Multi-Use Path Layout Plan
The Narrow River Bike Path
Narragansett, Rhode Island

Topographic and Structure Constraints

The multi-use path alignment would follow the existing berm or cleared path of the former Seaview Trolley line track bed that is roughly the center of the Narragansett Electrical easement.

Drainage Structures

As detailed in the Existing Corridor Conditions section above and indicated in Figures 4 thru 7, there are a number of existing drainage structures across or adjacent to the multi-use path alignment along the electric easement corridor. They are as follows:

1. Field conditions indicate that Bridgepoint Drive contains some abandoned catch basins and outlet storm drain pipes. These structures will need to be uncovered and/or reconstructed as needed.
2. 24″ pipe culvert crossing the raised berm, located between Bridgepoint Drive cul-de-sac and Morgan Drive cul-de-sac; Drains westerly towards the Pettaquamscutt River.
3. 18″ pipe culvert located east of raised berm approximately 400 feet south of Secluded Drive; Drains ditch southerly to low-lying area
4. 24″ pipe culvert outletting from Secluded Drive closed drainage system; Drains to ditch on east side of raised berm
5. Collapsed stone culvert of undetermined size crossing the raised berm; Located approximately 900 feet north of Secluded Drive; Drains westerly towards the Pettaquamscutt River.
6. Single span bridge with timber deck and stone abutments with 12-foot span; Located approximately 950 feet south of West Bay Drive; Drains east to west, towards the Pettaquamscutt River. The decking of this structure is greatly deteriorated. See the Structural Evaluation section in the Appendix for results of inspection.
7. 48″ pipe culvert continues ditch flow along the eastern ditch of the raised berm; Located 850 feet south of West Bay Drive; Drains north to south.
8. 36″ pipe culvert located under West Bay Drive, continues ditch flow along the eastern ditch of the raised berm; Drains north to south.
9. An undermined number of small pipe culvert appear to exist between West Bay Drive and Mettatuxet Road; Location of these pipes was not ascertained.

These structures were observed during field visits and must be individually evaluated to ensure they provide adequate capacity prior to constructing the path. Additional drainage structures may also exist within the corridor limits and would be identified by a full survey. The need for additional structures, such as a culvert to drain the open ditch crossing of the berm north of Middle Bridge Road, and ditches due to the creation of the multi-use path should be addressed during design.

A structural inspection of the single span bridge located south of West Bay Drive was performed. The inspection indicated that the bridge structure required a complete replacement for use by a multi-use path. A summary of the inspection results and recommended action is included in the Structural Evaluation section of the Appendix

Route Alternatives

In the 'Evaluation of Alternates' section above, an alternate routing of the proposed path along portions of the existing 20-foot wide sewer easement was investigated. A matrix was developed to outline the various advantages and disadvantages associated with this routing. The conclusion was to pursue the existing 50-foot wide Narragansett Electric easement corridor as the best for a multi-use path separated from the on-road bike route along Boston Neck Road.

Existing land uses and physical developments on and adjacent to the abandoned Seaview Trolley right-of-way present obstacles to the continuity of the multi-use path and terminating the path onto the local road system. Field reviews with aerial mapping were conducted to identify and evaluate various bikeway segment alternatives at these locations.

Secluded Drive Crossing
The multi-use path crossing at Secluded Drive is complicated by the current utilization of the Narragansett Electric easement by two property owners along the north side of the road. Parcels N-P Lots 1-69 and 1-17 are individually owned single-family residential properties. Each property owns half of the land encumbered by the electric easement and actively maintain a front yard and some landscape vegetation on this land. Continuing the multi-use path through these properties may be undesirable to the current owners as they will likely lose a portion of the front yard property.

The lots along the north side of Secluded Drive are all developed and offer no potential to deviate around the houses to continue the path along the electric easement.

The route could be continued as an on-road bike lane. From the south leg of the electric easement intersection with Secluded Drive, the northbound bike path traffic would need to cross Secluded Drive then the bike lanes can be continued westward along Secluded Drive then continue northward by providing a multi-use path connection between the Secluded Drive cul-de-sac and the Leeann Drive cul-de-sac. The route would continue north on Leeann Drive as a bike lane to the intersection with South Bay Drive. At this intersection the southbound bike lane would be required to cross South Bay Drive. The bike lanes could proceed eastward and northward from the intersection to the intersection of West Bay Drive and South Bay Drive, where the southbound path traffic would need to cross Tower View Court and West Bay Drive. The Narragansett Electric easement intersects West Bay Drive approximately 150 east of the South Bay Drive intersection. At the easement crossing

the northbound path traffic would be required to cross West Bay Drive to continue along the Narragansett Electric easement route.

This alternate is feasible due to the low volumes of traffic along these local roadways, however, the existing roadway is generally 24 feet in width and bike lanes would require an additional 4 feet on either side to provide adequate room for the bicycle traffic. In addition, sidewalks do not currently exist along any of these roadways. With the path intended as a multi-use path to be accessible to pedestrians and bicyclists, sidewalks would be necessary to provide continuity for all users. The construction cost and impacts resulting from the needs to widen the roadway, relocate the roadside drainage system and install sidewalks, combined with the impacts to the general value and safety of the route due to the on-road bike lanes and multiple on street crossings, make this an undesirable alternate.

Therefore, the preferred alternate at this location is to develop the proposed multi-use path along the electrical easement lands, minimizing the impacts to the adjacent property owners by limiting the right-of-way takings and providing landscaping and other shielding devices.

Utility Conflicts

Narragansett Electric actively maintains the entire run of poles and power lines along the electric easement. These overhead lines are three (3) phase 34.4 kV line-to-line distribution supply lines. The poles are generally offset from the center of the raised berm thereby providing sufficient clearance to construct the path along the raised berm. The alignment for the multi-use path will be set to provide a minimum of 3 feet horizontal separation from the edge of the paved path to the face of any utility pole. Geometric constraints along the corridor and efforts to minimize encroachment onto wetlands may require additional poles to be reset to provide the necessary offset distance.

Approximately three poles within the utility easement, south of West Bay Drive, are located along the centerline of the raised berm. These poles must be relocated to construct the path.

No additional conflicts were identified with any existing utilities or utility easements along the identified corridor. For utility correspondence see Appendix.

Property Owners & Right-of-Way Constraints

Property lines, right-of-way limits and property owners were collected from the Town of Narragansett records. A listing of the current property owners of the corridor for the multi-use path route along the electric easement corridor is provided in the Appendix with the abutting property owners also identified. The Tax Assessor Maps detailing the location of the corresponding lot numbers is provided in the Appendix.

At various locations ownership of the electric easement is split between the abutting property owners to either side. At other locations, the electric easement is owned by individual owners who typically own an adjoining parcel. The route from the intersection of Bridgepoint Drive and Boston Neck Road to its termination at Mettatuxet Road involves properties owned by 16 separate private owners, the United States Fish and Wildlife (USFW) and the Town of Narragansett. The following is a brief discussion of the required takings along the route, from south to north, and potential impacts:

Plat N-O, Bridgepoint Drive (Public Right-of-Way)
Owner: Town of Narragansett
This roadway provides vehicular access to a pump station with the majority of the roadway blocked off from vehicular use. The roadway is paved with a 50-foot right-of-way, approximately 1,350 feet in length, and abuts a large open field (N-O Lot 8), which is also owned by the Town. The approach pavement of this roadway may be reconfigured to provide additional paved areas for parking and other trailhead amenities such as path signing and bicycle racks for the path users. The paved surface can be utilized for the multi-use path.

Plat N-O, Lot 8
Owner: Town of Narragansett
This parcel is a large undeveloped field bordered by Boston Neck Road and Bridgepoint Drive. The northwestern corner of this parcel would support the multi-use path as it leaves the Bridgepoint Drive cul-de-sac and connects to the Narragansett Electric easement.

Plat N-L, Lot 41
Owner: Privately Owned
This is a small triangular shaped parcel, which is not developed. A full taking of this parcel would amount to approximately 0.04 acres.

Plat N-L, Lot 41-4
Owner: Privately Owned
This parcel is the full width of a portion of the electric easement, as well as, the adjoining land lying east of the easement and south of the Morgan Drive cul-de-sac. A residence is located on the portion of the property outside the easement limits. A partial taking of this lot, being the portion encumbered by the electric easement would be approximately 0.39 acres.

Morgan Drive
Owner: Town of Narragansett
The multi-use path would utilize the existing Morgan Drive right-of-way to continue across the cul-de-sac.

Plat N-L, Lot 41-5
Owner: Privately Owned
This parcel is the full width of a portion of the electric easement, as well as, the adjoining land lying east of the easement and north of the Morgan Drive cul-de-sac. A residence is located on the portion of the property outside the easement limits. A partial taking of this lot, being the portion encumbered by the electric easement would be approximately 0.14 acres.

Plat N-L, Lot 29
Owner: United States – Department of Fish and Wildlife (USFW)
This parcel is the full width of a portion of the electric easement, as well as, the adjoining land lying west of the electric easement. The land along the electric easement is undeveloped. The sewer easement runs along the western edge of the electric easement portion of this parcel. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.52 acres.

Plat N-L, Lot 14-3
Owner: Privately Owned
This parcel is the full width of a portion of the electric easement, as well as, the adjoining land lying east of the easement. A residence is located on the portion of the property outside the easement limits. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.40 acres. Additionally, an easement along a portion of the parcel abutting Middle Bridge Road may be necessitated to provide improved sight distance lines for pedestrians crossing the roadway. This added easement area is estimated at 600 square feet or 0.014 acres.

Plat N-P, Lots 1-51 & 1-52
Owner: United States – Department of Fish and Wildlife (USFW)
Lots 1-51 and 1-52 each occupy half of the 50-foot wide electrical easement. Both lots are undeveloped. A partial taking of Lots 1-51 and 1-52, being the portion encumbered by the electric easement, would be approximately 0.13 acres and 0.14 acres respectively.

Plat N-P, Lot 1-C-10
Owner: United States – Department of Fish and Wildlife (USFW)
This parcel is a continuation of Ridge Drive from the subdivision layout and crosses the electric easement corridor. This parcel is undeveloped. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.06 acres.

Plat N-P, Lot 1-84
Owner: United States – Department of Fish and Wildlife (USFW)
This lot occupies the west half of the electrical easement and the adjacent lands west of the easement. The lot is undeveloped. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.13 acres.

Plat N-P, Lot 1-86
Owner: Privately Owned
This lot occupies the east half of the electrical easement and the adjacent lands east of the easement. A residence, with access from Ridge Drive, is located upon this lot on the lands east of the electric easement. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.09 acres.

Plat N-P, Lot 1-83
Owner: United States – Department of Fish and Wildlife (USFW)
This lot occupies the west half of the electrical easement and the adjacent lands west of the easement. The lot is undeveloped. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.09 acres.

Plat N-P, Lot 1-85
Owner: Privately Owned
This lot occupies the east half of the electrical easement and the adjacent lands east of the easement. The lot is developed with a residence located upon the lands east of the electrical easement. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.13 acres.

Plat N-P, Lot 1-C-1
Owner: United States – Department of Fish and Wildlife (USFW)
This lot occupies the east half of the electric easement and the southern 31 feet of this lot traverses the full width of the easement. The lot is an undeveloped triangular lot located between Secluded Drive and Middle Bridge Road with a large depressed area that retains water. A culvert at the northern limits of the lot drains to the depressed area. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.36 acres.

Plat N-P, Lot 1-81
Owner: Privately Owned
This lot occupies the west half of the electrical easement and the adjacent lands west of the easement. The lot is developed with a residence located upon the lands west of the electrical easement. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.11 acres.

Plat N-P, Lot 1-79
Owner: Privately Owned
This lot occupies the west half of the electrical easement and the adjacent lands west of the easement. The lot is developed with a residence located upon the lands west of the electrical easement. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.03 acres.

Plat N-P, Lot 1-78
Owner: Privately Owned
This lot occupies the west half of the electrical easement and the adjacent lands west of the easement. The lot is developed with a residence located upon the lands west of the electrical easement. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.14 acres.

Plat N-P, Lot 1-77
Owner: Privately Owned
This lot occupies the west half of the electrical easement and the adjacent lands west of the easement. The lot is newly developed with a residence located upon the lands west of the electrical easement. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.09 acres.

Plat N-P, Lot 1-20
Owner: Privately Owned
This lot occupies the east half of the electrical easement and the adjacent lands east of the easement. The lot is developed with a residence located upon the lands east of the electrical easement. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.06 acres.

Plat N-P, Lot 1-19
Owner: Privately Owned
This lot occupies the east half of the electrical easement and the adjacent lands east of the easement. The lot is developed with a residence located upon the lands east of the electrical easement. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.06 acres.

Plat N-P, Lot 1-70
Owner: Privately Owned
This lot occupies the west half of the electrical easement and the adjacent lands west of the easement. The lot is adjacent to and south of Secluded Drive. The lot is developed with a residence located upon the lands west of the electrical easement. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.15 acres.

Plat N-P, Lot 1-18
Owner: Privately Owned
This lot occupies the east half of the electrical easement and the adjacent lands east of the easement. The lot is adjacent to and south of Secluded Drive. The lot is developed with a residence located upon the lands east of the electrical easement. A partial taking of this lot, being the portion encumbered by the electric easement, would be approximately 0.07 acres.

Plat N-P, Lot 1-17
Owner: Privately Owned
This lot occupies the east half of the electrical easement and the adjacent lands east of the easement. The lot is adjacent to and north of Secluded Drive. The lot is developed with a residence located upon the lands east of the electrical easement with a portion of the electric easement utilized as a landscaped front lawn. The partial taking of this lot should be minimized to the extent possible to limit the impacts to the property's front lawn. The electrical easement occupies approximately 0.10 acres of this lot. The exact size and limits of the taking will depend upon the final design for the path and its connection to Secluded Drive.

Plat N-P, Lot 1-69
Owner: Privately Owned
This lot occupies the west half of the electrical easement and the adjacent lands west of the easement. The lot is adjacent to and north of Secluded Drive. The lot is developed with a residence located upon the lands west of the electrical easement with a portion of the electric easement utilized as a front lawn. The partial taking of this lot should be minimized to the extent possible to limit the impacts to the property's front lawn. The electrical easement occupies approximately 0.10 acres of this lot. The exact size and limits of the taking will depend upon the final design for the path and its connection to Secluded Drive.

Plat N-Q, Lot 52
Owner: Privately Owned (Collectively by 28 Individual Owners)
This lot occupies the full width of the electric easement generally between South Bay Drive and Secluded Drive along with the adjacent lands west of the easement. A series of four multi-residential housing units are located on the northern limits of the lot and south of South Bay Drive. The remainder of the lot is undeveloped except for a single span timber bridge structure located within the electric easement. A partial taking of this lot, being the portion encumbered by the full width of the electric easement, would be approximately 2.17 acres.

Plat N-Q, Lot 50-F
Owner: United States – Department of Fish and Wildlife (USFW)
This lot is the full width of the electric easement generally south of West Bay Drive and north of South Bay Drive. The lot is undeveloped. The west edge of the lot is bordered by a number of residential properties with single-family homes. A full taking of this lot would be approximately 0.88 acres.

Plat N-Q, Lot 50-D
Owner: United States – Department of Fish and Wildlife (USFW)
This lot occupies the full width of the electric easement and the lands generally east of the easement. The lot continues north from West Bay Drive. The lot is undeveloped. Single family homes exist on the two lots north of West Bay Drive and bordering the east and west sides of the electric easement. A partial taking of this lot,

being the portion encumbered by the full width of the electric easement, would be approximately 0.53 acres.

Plat N-H, Lots 131-1 & 131-2
Owner: Privately Owned
This lot is the full width of the electric easement from Mettatuxet Road south to approximately 1400 feet south of Mettatuxet Road. The land is undeveloped with a number of new residential properties bordering along the east edge of the lot. A full taking of this lot would be approximately 1.61 acres.

Traffic/Safety Issues

A major objective in the route alternative evaluation is the provision of high safety standards. As a separated facility from the on-road bike route, this multi-use path would offer less advanced bicyclists a safer and more comfortable route for travel. The multi-use path interaction with the intersecting roadways was studied to determine the appropriate treatment for each location based upon traffic volumes, travel speeds and sight lines.

Morgan Drive
The crossing of Morgan Drive will occur at the end of the cul-de-sac bulb. This roadway is a low volume local road. An advanced warning sign indicating the multi-use path crossing and crosswalk pavement markings should be installed for this crossing.

Middle Bridge Road
The crossing of Middle Bridge Road occurs west of a reverse curve in the alignment. This condition causes sight distances for viewing westbound traffic to be limited to 170 feet and 370 feet when viewed from the crossing location on the north and south sides respectively. The sight distances available from the south side of Middle Bridge Road towards the eastbound traffic are both in excess of 500 feet.

The Stopping Sight Distance (SSD) for 35 mph design speed is 250 feet, as listed in AASHTO-Geometric Design of Highways and Streets (2001) Exhibit 3-1 (See Appendix). To provide the SSD as a minimum design the existing 170-foot sight line must be improved. Currently vegetative growth along the north side of Middle Bridge Road and east of the electric easement corridor limits the available sight distance. The portion of the parcel, Plat N-L, Lot 14-3 owned by a private landowner, required to be cleared to provide the sight distance is overgrown land and not developed. An easement of this area could be obtained and the area kept cleared of vegetative growth.

An independent study of pedestrian crossing sight distances titled 'Trail Intersection Design Guidelines' by Wayne Pein is referenced (See Appendix) for determination of desired sight distances. The sight distances are based upon 3 seconds of perception

and reaction time and a walking rate of 3.5 feet per second. Combining the street width and vehicle design speeds yields a desired crossing sight distance of 500 feet.

The maximum sight distance possible should be provided, along with advance warning signs on the Middle Bridge Road approaches and crosswalk pavement markings.

Secluded Drive & West Bay Drive
Both of these roadways have low volume residential traffic, with relatively sufficient sight lines based upon the traffic and speed. Advance warning signs and crosswalk pavement markings are recommended at these crossings.

Mettatuxet Road
Available sight distances for all pedestrian movements across Mettatuxet Road at the location where the proposed path would terminate at Mettatuxet Road is in excess of 500 feet. The Stopping Sight Distance for 30 mph design speed is 200 feet, as listed in AASHTO-Geometric Design of Highways and Streets (2001) Exhibit 3-1 (See Appendix). The recommended pedestrian crossing sight distance for Mettatuxet Road as detailed in the 'Trail Intersection Design Guidelines' report is 445 feet.

Warning signs at the approaches on Mettatuxet Road are recommended along with crosswalk pavement markings and a sidewalk ramp to access the sidewalk located on the north side of the road.

Boston Neck Road
Boston Neck Road is a dedicated bike route. A separated multi-use path facility developed along the electric easement corridor would terminate at the intersection of Bridgepoint Drive with Boston Neck Road. To provide access between the Boston Neck Road northbound bike route and the multi-use path, a crosswalk would be required across Boston Neck Road.

Available sight distances as measured in the field are 540 feet and 800 feet from the east side of Boston Neck Road viewing the northbound and southbound traffic respectively. From the west side of Boston Neck Road, available sight distances of 700 feet and 800 feet were measured for viewing the northbound and southbound traffic respectively.

The Stopping Sight Distance (SSD) for 45 mph design speed is 360 feet, as listed in AASHTO-Geometric Design of Highways and Streets (2001) Exhibit 3-1 (See Appendix). All sight distances measured exceed this distance. An independent study of pedestrian crossing sight distances titled 'Trail Intersection Design Guidelines' by Wayne Pein is referenced (See Appendix) for determination of desired sight distances. The sight distances are based upon 3 seconds of perception and reaction time and a walking rate of 3.5 feet per second. Combining the street width and vehicle design speeds yields a desired crossing sight distance of 940 feet. The

presence of the parapet wall along the shoulders of the Boston Neck Road bridge over the Narrows River restricts the sight distances towards northbound traffic.

Additional study of traffic and pedestrian volumes, as well as, gap analysis may be needed to determine the appropriate crossing treatments. The available sight distances appear sufficient to allow pedestrians to safely cross the roadway.

Intermodal Opportunities

Various modes of transportation available near and around the multi-use path corridor were evaluated to identify and optimize potential connections with the path. Facilitating intermodal opportunities provides greater exposure and increases the ability for the path to be utilized as a transportation link and provides relief to constrained roadways and parking facilities.

The surrounding roadway network offers the area residents numerous connections to the multi-use path. In addition, the development of parking facilities for both bicycles and automobiles along the multi-use path is vital to allow regional users to utilize the path.

At the southern limits of the path near the intersection of Bridgepoint Drive and Boston Neck Road, the undeveloped land, Parcel N-O Lot 8, located in the northwest quadrant is called Bridgepoint Commons. This is a large town owned parcel and offers an opportunity to develop a trailhead facility with parking, bike racks, signing detailing the path and area attractions and a meeting location. This parking can be developed for a length of Bridgepoint Drive or concentrated on a portion of the parcel. The parcels lying westerly of Bridgepoint Drive are owned by the United States Department of Fish and Wildlife (USFW) and therefore not recommended for parking lot development.

On street parking along the local roadways intersecting the path should not be encouraged as an option for the paths usage. As the local roadways are generally narrow and any added vehicles may negatively affect the roadway and path crossing safety. The level of existing development and the presence of significant areas of adjoining lands owned by the USFW complicate creating localized parking areas along the path.

Sidewalks exist on either side of the Sprague Bridge over the Narrows River and continue south towards the Narragansett Beaches. The identified path is intended as a separate facility from the on-road bike route for use by joggers, roller bladders and bicyclists. Providing a sidewalk connection from the southern limits of the multi-use path to the sidewalk on the west side of the Sprague Bridge will offer a continuous safe route for non-bicycle users to access the beaches and points to the south.

Bicycle racks, route signing and signs detailing area attractions should be provided at the various intersecting roadways. In addition, interpretative signing can be provided at different locations highlighting unique area plant and wildlife species.

Transit Connections

Existing transit facilities around the study area corridor include Rhode Island Public Transit Authority (RIPTA), which operates bus routes through the area, Amtrak and a number of ferries operating out of Narragansett.

RIPTA provides bus service along two routes through the Town of Narragansett with stops in the vicinity of the study area corridor. Line #64, Newport – URI, runs from the Kingston Station (Amtrak) to the Newport Gateway Center and connects a number of attractions including the URI campus, Point Judith, the Town of Jamestown and Newport. Line #14, Wickford/Narragansett, offers a transfer location with Line #64 at the Boston Neck Road (Route 1A)/Bonnet Shores Road intersection. Line #14 traverses the towns of North Kingstown and Narragansett providing access to the Wickford area. RIPTA operates a program called Rack n' Ride, where free of charge, riders may load their bicycle on the buses. This service expands the ability for people to travel to the surrounding areas and utilize the paths as a transportation alternative and a recreational facility.

Bike Routes

The established on-road bike route along Boston Neck Road (Scenic Route 1A) terminates to the north at Wickford Village. A multi-use path is currently under consideration to provide a dedicated off-road multi-use path from Wickford Village to Wickford Junction near Route 4. The southern limits of the Boston Neck Road bike route connects to Point Judith and Galilee with access to the ferries running to Block Island.

The South County Bike Path currently extends from the Kingston Station to Peace Dale (See Appendix for South County Bike Path map). An extension of this path from Peace Dale to Wakefield is under construction with further extensions towards the South County Museum under consideration.

Another bike route envisioned within the Town of North Kingstown is a connection from the Wickford Village area to Quonset Point. Various public and private studies have been conducted regarding the feasibility of such a connection.

Providing route connectivity for all the paths users allows more trips and recreational endeavors to be accomplished without the use of cars. The path's links to area attractions, open spaces and natural environments increases the opportunities for people to enjoy these features.

Environmental Impacts

Environmental data was collected from a variety of sources and utilized to evaluate the potential impacts from the development of a multi-use path along the electric easement corridor. The analysis of route alternative is based upon this data, as well as field investigations. The results of the environmental evaluation is discussed below with additional information and correspondence letters presented in the Appendix.

A summary of the overall involvement and potential environmental impacts of the proposed path is discussed below.

Farmland Impacts

The *Soil Survey of Rhode Island* (Rector, 1981) identifies the following soil map units along the project alignment.

Table 3 -
Soil Map Units

Map Unit Name	Prime Farmland	Approximate Length (ft)
Birchwood sandy loam	Yes	480
Mansfield mucky silt loam	No	200
Matunuck mucky peat	No	200
Pittstown silt loam 0-3 %	Yes	1,800
Pittstown silt loam 3-8 %	Yes	2,250
Rainbow silt loam 3-8%	Yes	1,000
Rainbow very stony silt loam 0-8 %	No	900
Stissing silt loam	Yes, where drained[1]	1,900
Stissing very stony silt loam	No	1,050

[1] Refers to artificial drainage installed in agricultural fields.

Prime farmland soils are mapped along the project alignment, however, no areas of active farmland within the alignment were observed during the Site inspection. There is a short segment of the alignment near a prime farmland map unit managed as meadow, however a wooded buffer separates the easement from the meadow, and the prime farmland unit is not provided any access from the easement. There will be no impact on prime farmland as a result of the Project.

Relocation Impacts and Right-of-Way Acquisition

The Project is located along an existing active electric distribution line easement, the majority of which contains an approximately 12-foot wide dirt access trail. Evidence of use by pedestrians in some segments was observed during a field inspection on

July 10, 2003. Most of the work associated with the Project will occur within the existing transmission line easement. However, there are areas of the easement that are landscaped north and south of Secluded Drive. The studied corridor may involve right-of-way acquisition in these areas to maintain the continuity of the alignment.

In addition, a portion of the lands east of the electric easement and north of Middle Bridge Road may need to be acquired to provide adequate sight distance. The portion of this parcel to be acquired is currently unmaintained land with vegetative growth.

Considerations Relating to Pedestrians and Bicyclists

During construction of the multi-use trail, access to the existing trail from Mettatuxet Road south to Route 1A would be temporarily restricted. The unimproved condition of the existing trail along the easement currently restricts access to pedestrians and mountain bicycles only. Upon completion of the multi-use trail, pedestrian access will be reestablished. In addition bicycles and roller blades would have access to the path and the path will be handicapped accessible in accordance with the Americans with Disabilities Act.

Air Quality Impacts

The Project does not involve any action that will significantly increase traffic volumes within the area of the project alignment, or result in any significant changes in use. Accordingly, the project does not have the potential to cause new air quality standard violations.

Fugitive dust will be suppressed during the construction phase of the project through the application of water or other approved methods.

Air quality analysis has not been performed as part of this Environmental Evaluation.

Noise Impacts

No sensitive noise receptors were identified in the vicinity of the proposed multi-use trail that would be impacted by the Project. The surrounding development is primarily residential use, and wetland and forested land. The Project will occur (substantially) within the existing easement. Any noise impacts associated with construction will be short term. Construction operations will be restricted to between 7:00 AM and 5:00 PM, Monday through Saturday.

Water Quality Impacts

The Rhode Island Department of Environmental Management (RIDEM), Office of Water Resources identifies groundwater along the Project alignment as Class GA. GA groundwater areas are considered potable without treatment. There are no

wellhead protection areas in the vicinity of the Project alignment. The Project will not impact groundwater.

The southern limit of the project alignment terminates at the Narrow River. This segment of the Narrow River is classified by the RIDEM as Class SA waters. Class SA waters are designated for shellfish harvesting for direct human consumption, primary and secondary contact recreational activities, and fish and wildlife habitat. They shall be suitable for aquacultural uses, navigation, and industrial cooling. These waters shall have good aesthetic value.

Sedimentation and erosion controls will be utilized during construction to prevent turbid discharges into the storm sewer system and waters of the state.

Wetlands

There are state and federal regulated wetlands located adjacent to and within portions of the Project corridor. According to the Freshwater Wetlands Jurisdictional Boundary for Narragansett (http://www.narrbay.org/mapping/crmc-juris/view/narr.jpg) the project alignment lies entirely within Coastal Resources Management Council (CRMC) jurisdiction. These wetlands are subject to regulation by the Coastal Resources Management Council (CRMC) and the Army Corp of Engineers (ACOE). The Project will require wetland permitting.

Wetlands and their existing crossings identified during a site visit on July 10, 2003 are detailed as follows:

- Mettatuxet Road south approximately (app) 900 feet: wetlands are located east and west of the utility line access trail. The access trail is in a fill section with ditches along the east and west sides. A US Fish and Wildlife posted wildlife refuge is west of this trail. Between pole structures 512 and 513 is a culvert under the access trail and water flows west under the trail.
- North of West Bay Drive to pole structure 517 (app 300-feet) there are wetlands east and west of access trail (a wet ditch is east of the access trail).
- South of West Bay Drive app 50-feet across the access trail is wetland, then the trail is in a fill section with ditches to the east and west. The eastern ditch includes a stream that flows south midway between structures 523 and 524 where it flows west across the alignment and under a wooden bridge on rock abutments. Wetlands are present both east and west of the access trail. The road is in fill. This wetland system extends south to app. 300 feet north of Jennifer Court. A partially collapsed stone culvert conveying a three-foot wide stream across the alignment is located app. 50-feet south of structure 528. A wet spot at structure 530 may require a bridge or culvert.
- South of Jennifer Court on the east side of the access trail, a wet ditch flows south app. 600 feet into a pond.
- Between structures 538 and 539 and south to Middle Bridge Road the improved access trail terminates and the ROW is in wetland.

- From Middle Bridge Road south app. 1,300 feet the ROW remains in wetland with isolated upland areas. The remaining access trail south to the Narrow River is primarily in upland with wetlands located to the west and very limited areas where the access trail is wet.

Wetland alteration will be needed to complete the project. Wetland impacts can be avoided or minimized through the use of design measures such as bridges, arch culverts, and retaining walls along the identified alignment.

Floodplain Impacts

The majority of the Project Alignment is located within Zones B and C, as indicated on Federal Emergency Management Agency Flood Insurance Rate Mapping for the Town of Narragansett, Rhode Island (Community Panel Numbers 445402 0002 D and 445402 0004 D; Maps revised June 16, 1992). Zone B is defined as areas between the limits of the 100-year and 500-year floods. Zone C is defined as "Areas of minimal flooding." The final 250 feet of the easement is located within Zone A8 (an area of the 100-year flood) with a base flood elevation of 11 feet above NGVD 1929.

Any of the identified improvements that will impact flood storage will be required to be mitigated with a net zero flood storage loss, except when the loss is within the flood zone of tidal waters.

Coastal Impacts

The Coastal Resources Management Program (CRMP) classifies the waters in the Pettaquamscutt River as "low intensity use" Type 2 Waters. Coastal salt marsh is located west of the easement and the proposed path terminates at the Narrow River near the top of a coastal bluff. The project will have no impact on existing water use classifications.

Alteration of coastal features or wetlands may be needed to complete the Project. Coastal impacts may be minimized through appropriate design measures.

Threatened or Endangered Species

The construction of the multi-use path will generally take place within the existing utility easement.

A review of the available Natural Heritage Program mapping of the area surrounding the project alignment with RIGIS rare species coverage indicates that the Pettaquamscutt River and its associated wetland resources located west of large segments of the easement are within a polygon of an estimated habitat and range of rare species or a noteworthy natural community. The southern most 800 feet of the identified alignment is located within the polygon of an estimated habitat and range of rare species or a noteworthy natural community.

VHB has coordinated with the Rhode Island NHP and the United States Fish and Wildlife Service (USFWS) regarding the presence of state and federal-listed rare, threatened or endangered plant or animal species in or along the Project alignment. The USFWS has indicated that no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the USFWS are known to occur in the project area (refer to attached correspondence). No further coordination is necessary with the USFWS. The NHP has indicated that there are no state-listed rare or endangered species or exemplary natural community types known to occur in the vicinity of the Project (refer to attached correspondence). No further coordination is necessary with the NHP.

Historic and Archaeological Preservation

In accordance with current RIDOT policy, the RIDOT coordinates directly with the Rhode Island Historic Preservation and Heritage Commission regarding properties listed on or eligible for listing on the National or State Registers of Historic places.

Hazardous Waste Sites

A review of federal and state environmental databases was conducted with an Environmental FirstSearch Report (attached) and is summarized here to help identify properties in the vicinity of the Project alignment that have had a release or threat of release of oil and/or hazardous materials. VHB reviewed sites from the National Priority List (NPL), the Resource Conservation and Recovery Act (RCRA) Corrective Action Sites (COR), RCRA Generators (GEN), Transportation, Storage Disposal Facilities (TSD), the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), State Sites, Emergency Response Notification System (ERNS), No Further Remedial Action Planned (NFRAP), Underground Storage Tanks (USTs), Leaking USTs (LUSTs) and Solid Waste landfills (SWLs) within the standard ASTM search radii of the project site. Non-geocoded sites are sites with minimal address information that may be located in close proximity to the subject Site. VHB noted that none of the non-geocoded sites appeared to be located within 500-feet of the Project alignment.

The Project alignment was not identified in any of the databases searched. No NPL, CERCLIS, NFRAP, RCRA TSD, RCRA COR, RCRA GEN, ERNS, State Sites or SWLs were listed within the specific search distances. Facilities located within the specified search radius included two REG UST/AST Sites, one Spill Site and one LUST Site. The Spill Site is located down gradient of the proposed project alignment and as such that oil or hazardous materials are not expected to be encountered during the multi-use path construction activities. Research of records with the Rhode Island Department of Environmental Management indicates that the REG UST/AST Site, identified at the Sprague Bridge Pumping Station, has been removed and is no longer present. Please refer to the attached Environmental FirstSearch Report for details of the full results.

Construction Impacts

Construction of the Project will result in temporary disruption of limited existing pedestrian access to the work area. Traffic access at road crossings will be maintained during construction.

Construction related noise will be limited to normal work hours, typically between 7:00 AM and 5:00 PM. Dust control may be required that would consist of water sprinkling and similar methods. Impacts to water quality within the work area will be minimized by the implementation of soil erosion and sedimentation control best management practices.

Visual Impacts

The project consists of constructing a paved multi-use trail along an existing corridor. Segments of the corridor are currently used by pedestrians. The Project may require limited vegetation clearing and trimming. The easement maintained by the utility company is cleared of trees. The limited clearing and trimming of vegetation will be a temporary impact. The project will not result in any permanent visual impacts.

Public Facilities

No public facilities exist in the direct vicinity of the project alignment.

Maintenance Responsibility

The multi-use path would be constructed by RIDOT with a maintenance agreement with the Town of Narragansett. The Town will be responsible for operational maintenance and policing of the facility.

Multi-Use Path Findings

For this project to advance beyond the Study and Development phase, extensive coordination and support from the Town of Narragansett will be required. The purpose of this report is to document the necessary improvements, environmental constraints and estimated construction costs associated with the development of a multi-user path as a separated facility, so all the pertinent information is available to both local and state decision makers. Inclusion of this project in the TIP will be necessary to advance this project into engineering.

The various design and mitigation efforts to minimize the impacts resulting from the development of the multi-use path along the approximately 2-mile corridor of the former Seaview Trolley Line result in the conclusion of a possible alignment. This alignment maximizes the benefits of the path and may provide the best solution to achieve the goals of the Town of Narragansett. However, the lack of connectivity of this path to activity centers and destinations should be considered. The following outlines the summary findings for a multi-use path accessible to users of all abilities along the identified alignment.

Summary Findings

The alignment of the separated facility may follow the existing cleared path along the raised berm of the former Seaview Trolley Line corridor from Mettatuxet Road to the cul-de-sac of Bridgepoint Drive roadway, then along Bridgepoint Drive to the intersection with Boston Neck Road. A crosswalk will be required across Boston Neck Road to allow users to continue along the Boston Neck Road on-road bike route.

The typical section of the multi-use path is a 12-foot wide paved path with 2-foot wide gravel shoulders at 6:1 slopes or flatter. The profile and all connecting elements of the path shall be constructed to meet the requirements of the Americans with Disability Act.

The separated facility requires at-grade road crossings at Boston Neck Road, Morgan Drive cul-de-sac, Middle Bridge Road, Secluded Drive, West Bay Drive and Mettatuxet Road. Necessary improvements for path continuity at these crossings include crosswalk pavement markings and advanced signing alerting both drivers and the path users of the crosswalk.

The crosswalk at the path's intersection with Middle Bridge Road requires additional efforts to provide adequate sight distances. An easement or acquisition of a portion

of Parcel N-L Lot 14-3 to maintain sight lines cleared of vegetation is a possible solution.

At the north termination point of the path at Mettatuxet Road, an accessible sidewalk ramp should be constructed on the north side of the roadway to provide safe pedestrian access. Additional signing is recommended at this location to inform the path users of the Boston Neck Road on-road bike route further east.

The existing bridge structure located between West Bay Drive and Secluded Drive would need to be replaced. A precast arch bridge with barrier and railings was utilized for cost estimating purposes. Additional details of the structural improvements to the bridge are detailed in the Appendix.

Impacts to the existing drainage structures must be individually evaluated during the design phase. Size, capacity and the geometric layout of these structures will determine the need for replacement culverts. Existing ditch flows should be generally maintained.

Wetland mitigation will be required for the construction of a path through this area west of Boston Neck Road. The exact nature, location and quality of the impacted wetlands and the appropriate mitigation must be addressed during the design process and coordination with the Rhode Island Department of Environmental Management (RIDEM) and the Town of Narragansett.

A sidewalk constructed along the west side of Boston Neck Road between Bridgepoint Drive and the Sprague Bridge would provide a valuable connection for non-bicycle users of the separated facility. The sidewalk can be constructed with minor adjustments to the side slope on the west side of Boston Neck Road.

Parking facilities for vehicles and bicycles, and additional amenities, such as benches, water fountains, and restrooms, should be considered for construction at the southern limit of the path route at the Bridgepoint Commons in conjunction with the development of a separated facility. The development of parking and other amenities can be staged to accommodate other potential improvement planned for Bridgepoint Commons, which include picnic and sitting areas, entrance signing, and a little league field. Signs informing the users of the paths route, local amenities and restrictions for use should be erected along the length of the path and at the various entrances as warranted. Collapsible bollards should be erected at each of the path ends intersecting with roadways to prevent motorized vehicles from accessing the path.

Construction Cost Estimate

The construction of a multi-use path as a separated facility from the Boston Neck Road on-road bike route was evaluated to determine an estimate of the probable construction costs. The costs were based upon historical construction bid item costs. An estimated cost of construction for the multi-use path based upon full design following AASHTO guidelines is $1,409,000. A breakdown of the cost estimate is provided in the Appendix.

In summary, the above estimate does not include costs associated with any required environmental mitigation such as wetland impacts, or costs arising from property acquisitions.